

EFFECT OF FEEDING DDGS (DRIED DISTILLERS GRAINS WITH SOLUBLES) IN THE GROWTH AND HAEMATOLOGICAL PARAMETERS OF CROSSBRED LARGE WHITE YORKSHIRE PIGLETS

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ABSTRACT

A study was conducted on eighteen growing crossbred Large White Yorkshire piglets to see the effect of increasing dietary level of dried distillers grains with solubles (DDGS) on growth performance, feed intake, feed conversion efficiency, haematological parameters and cost economics under intensive system. The piglets were divided into three dietary treatment groups T_1 (control with 0% DDGS), T_2 (Treatment with 10% DDGS) and T_3 (Treatment with 20% DDGS) of six animals each and fed on the respective diets for the period of 90 days. There was no significant difference ($P>0.05$) in the final weight, the total weight gain, and the average daily gain. Also there was no significant difference ($P>0.05$) in the total feed intake and feed conversion ratio (FCR). However, the cost/kg gain (Rs.) differ significantly ($P<0.01$) with the cost/kg gain reduced by 8.10% in T_3 followed by 5.48% in T_2 when compared with T_1 ration. Blood parameters from the present study showed RBC, HGB, HCT, MCV, MCH, MCHC, PLT, LYM, RDW-SD, RDW-CV, MID and PCT values falls within the normal values of pigs. Whereas WBC, MPV, GRAN, PDW and P-LCR showed significant difference and indicated that, there were no adverse effects on the health of the animals after feeding the DDGS based diets.

KEYWORDS: DDGS, LWY Piglets, Growth Rate, Average Daily Gain, Feed Intake, FCR, Cost Economics & Haematological Parameters

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INTRODUCTION

Pig rearing plays an important role for improvement of socio-economic condition of poor farmers in India and other developing countries. In India and other developing countries, pig raising and pork industry are in the hands of small, marginal farmers, agricultural and landless labourers. The total population of pigs in the country is 10.29 M (Livestock census, 2012). It is still considered as backward profession and unorganized rearing largely dominates the sector, and it is primarily in the hand of poor, landless and weaker section of society.

However, perception towards the swine industry in India is changing from subsistence to commercial level due to rapid growth of this sector. This also can be attributed to the change in food habits of human population. Through their prolificacy, high feed conversion ratio, shorter generation interval, fast growth rate and high dressing percentage, pigs are enhancing the rural economy to resolve the acute demand for protein of high biological value, comparatively at low cost.

Recent record high feed ingredient prices due to the demand for grains and limited grain source around the world are causing the animal nutritionists to search for lower cost alternative feed ingredients to minimize the cost of food animal Production. Therefore, alternative energy supplying pig feed ingredients should be explored, like distillers dried grains with solubles (DDGS) from the bio-fuel and food industry. With the increase in commercial production of ethanol, the supply of DDGS is also likely to increase. DDGS might play an important role in meeting the dietary energy needs of pigs as biodiesel production expands. Therefore producers are advised to incorporate DDGS when this co-product is favourably priced relative to corn and soybean meal.

MATERIALS AND METHODS

Eighteen crossbred growing Large White Yorkshire piglets aged about 2.5 months were selected from the Instructional Livestock Farm Complex (ILFC), College of Veterinary Science, Rajendranagar, Hyderabad for conducting a growth trial for a period of 90 days. These piglets were then randomly allotted to 3 groups (6 in each treatment) in a Completely Randomized Design (CRD). The live body weight of the experimental animals was recorded every week before offering feed and water in the morning. The feed intake was recorded daily, fresh and clean drinking water was made available throughout the day. From all the groups, blood was collected at the end of the experiment, the piglets were fasted for 12 hrs before the collection. 1.5 ml of blood was collected in an anticoagulant coated vacutainers.

RESULTS AND DISCUSSIONS

Growth Performance

The initial body weights were 9.26 ± 0.45 , 9.21 ± 0.51 and 9.73 ± 0.46 which increased to 38.08 ± 1.42 , 38.83 ± 2.15 and 39.51 ± 2.96 for Control (T_1), Treatment (T_2) and Treatment (T_3), respectively at the end of the experiment, the detail datas are given in Table 1. The final weight was higher in T_3 group compared to T_1 and T_2 groups. However, there was no significant difference ($P > 0.05$) in the mean body weights. Though there was increase in the weight gain in the experimental groups as compared to the control group, the weight gain was statistically not significant. The final weight and average daily gain was higher in T_3 group compared to T_1 and T_2 groups. The increase in weight gain was 3.33% in T_3 followed by 2.27% in T_2 when compared to T_1 group. But there was no significant difference ($P > 0.05$) in the mean body weights, weight gain and ADG among the three groups. The feed intake and feed conversion ratio showed slight variation but they did not differ significantly ($P > 0.05$) among the different groups. The higher performance shown by piglets having higher concentration of DDGS might be due to higher digestibilities of nutrients in the diets.

The total cost/ kg gain was Rs. 373.90 ± 0.10 , Rs. 353.40 ± 0.20 and Rs. 343.80 ± 0.11 for T_1 , T_2 and T_3 groups, respectively. There was significant difference ($P < 0.01$) in the cost per kg gain among the different experimental diets. DDGS based diets were found to be more economical than the control group. It might be due to higher price of soybean meal, used in higher quantity in T_1 and T_2 groups. The cost per kg gain was reduced by 8.10% in group T_3 followed by 5.48% in group T_2 when compared with group T_1 .

Haematological Parameters

The mean haematological parameters are shown in Table 2, the haematological parameters studied in this experiment can be compared with the standard values given in the Merck Veterinary manual, 2005. RBC, HGB, HCT, MCV, MCH, MCHC and PLT values falls within the normal values of pigs. LYM had a bit higher values than the normal range. WBC values differ significantly ($P<0.05$) and other parameters did not show significance difference ($P>0.05$) among the three groups. Also for values like GRAN, PDW ($P\leq 0.05$), MPV ($P<0.05$), and P-LCR ($P\leq 0.01$) showed significant difference whereas for RDW-SD, RDW-CV, MID and PCT showed no significant difference ($P>0.05$) among the experimental groups.

Table 1: Effects of Dietary Treatment on Growth Performance, Feed Intake and Cost Economics

	T ₁	T ₂	T ₃
Growth Performance			
Initial body weight (kg)	9.26±0.45	9.21±0.51	9.73±0.46
Final body weight (kg)	38.08±1.42	38.83±2.15	39.51±2.96
Total weight gain (kg)	28.82±1.24	29.62±1.97	29.78±2.74
Average daily gain(gms)	343.07±14.74	352.58±23.47	354.56±32.59
Feed Intake			
Total feed intake (kg)	460.50±21.69	455.50±30.56	452.60±23.39
Average daily feed intake (gms)	913.69±13.59	903.81±15.90	897.98±9.28
Feed efficiency (kg)	2.69±0.11	2.63±0.21	2.66±0.28
Cost Economics			
Cost of feed/kg gain (Rs.)	373.90±0.10	353.40±0.20	343.80±0.11

Table 2: Haematological Parameters of Piglets Fed with Dietary Treatments with DDGS

Parameters	T ₁	T ₂	T ₃	Normal Values*
RBC (X 10 ⁶ /uL)	7.26±0.26	7.04±0.16	7.03±0.37	5-7
WBC (X 10 ³ /uL)	10.55±0.82	9.25±0.71	7.40±0.74	11-22
HGB (g/dL)	12.95±0.57	12.38±0.48	12.68±0.29	9-13
HCT (%)	38.30±1.23	38.30±1.03	38.17±0.98	36-43
MCV (fL)	54.10±1.19	53.67±1.21	53.55±0.64	52-62
MCH (pg)	18.30±0.22	18.17±0.37	18.03±0.15	17-24
MCHC (g/dL)	34.38±0.80	32.52±0.46	35.0±1.65	29-34
PLT (X 10 ³ /uL)	395.50±43.11	382.50±11.91	302.33±41.05	200-500
LYM (%)	93.27±0.97	92.92±0.52	89.25±2.31	35-75
GRAN (%)	4.15±0.53	4.10±0.31	7.75±1.79	-
RDW-SD (fL)	37.15±2.18	38.67±2.12	35.50±1.32	-
RDW-CV(%)	17.01±0.70	17.43±0.79	16.58±0.53	-
MID (%)	2.78±0.39	3.0±0.20	3.42±0.42	-
MPV (fL)	9.38±0.29	9.73±0.20	10.28±0.11	-
PDW (%)	9.23±0.24	9.87±0.12	9.70±0.14	-
PCT (%)	0.38±0.05	0.35±0.02	0.27±0.03	-
P-LCR (%)	16.27±1.09	17.93±0.91	21.25±0.88	-

Normal values* referred from 'The Merck veterinary manual', ninth edition. 2005.

CONCLUSIONS

Results from the present study indicated that inclusion of 10% and 20% DDGS in rations did not have adverse effects on piglets in terms of their growth performance, feed intake, FCR and blood parameters. It was also proved to be

more economical than the conventional feed. Blood parameters from the present study showed RBC, HGB, HCT, MCV, MCH, MCHC, PLT, LYM, RDW-SD, RDW-CV, MID and PCT values falls within the normal values of pigs. Whereas WBC, MPV, GRAN, PDW and P-LCR showed significant difference and indicated that, there were no adverse effects on the health of the animals after feeding the DDGS based diets. Hence, DDGS could be recommended in the ration of swine, at 20% without affecting their growth performance, feed intake and FCR, nutritive value of the feed and also to reduce the total cost of production.

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